EXPERIMENTS WITH POULTRY

OHIO
Agricultural Experiment Station

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BULLETIN 262

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EXPERIMENTS WITH POULTRY

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BULLETIN

OF THE

Ohio Agricultural Experiment Station

NUMBER 262 JUNE, 1913.

EXPERIMENTS WITH POULTRY

R. M. SHERWOOD W. J. BUSS

INTRODUCTION

The data presented in the following pages constitute the first report of experimental work in poultry husbandry done at this Station. While the work is too new to afford final data along many different lines, or even along any line, yet the results that have been secured thus far are of interest and value to poultrymen. Poultry work was begun in a small way in November, 1909, by B. E. Carmichael; in December, 1910, R. M. Sherwood took charge of the poultry work and remained in charge until September 30, 1912. Since early in 1913, W. J. Buss has had charge of this work.

Trap nest records of hens are being kept; experiments with different kinds and proportions of feeds for growing chicks and for laying hens are under way; incubation tests have been begun; and further experiments in feeding for meat are in progress or in prospect. Much of this work will need to be carried on for a number of years before results may be secured that will justify the drawing of final conclusions; in some of the work, results may be secured in a relatively short time. Most of the poultry is kept at the main Station farm near Wooster; a smaller flock is kept at the Southeastern Test Farm, Carpenter, Ohio.

COST OF EGG PRODUCTION

I

The object of this work was to secure data relative to the cost of egg production and to the variation in rate and economy of production that may be expected when different lots of fowls are treated alike. The results to be compared included feed consumed, eggs laid, gain or loss in weight, mortality, and cost of production based on these factors. This experiment, conducted at the Southeastern Test Farm, began December 5, 1910, and ended December 4, 1911.

Description of pullets: The pullets used in this test were Single Comb White Leghorns. They were secured from two sources—75 April hatched pullets were purchased from one flock, and 149 April and May hatched, from another flock. The lots of pullets for the test were made up by placing as nearly as possible the same number from each source in each lot.

Housing and yarding: The pullets were housed in a 20 ft. x 60 ft. half monitor roofed laying house, similar in type to the 24 ft. x 100 ft. house illustrated on page 538. This house contains a feed room 8 ft. x 20 ft. in the west end, and four 13 ft. x 20 ft. pens. The light and ventilation were alike in all pens. During warm weather the pullets had access to a yard 13 ft. x 60 ft. in size. This yard furnished no green feed.

Ration and manner of feeding: All lots were fed the same ration. Until January 19 the grain mixture was composed of 4 parts, by weight, cracked corn and 3 parts wheat. The mash mixture up to this time was made up of bran, 1 part; linseed oilmeal, 1 part; beef scrap, (50 percent protein) 1 part. After the above date the grain mixture was composed of cracked corn, 3 parts; wheat, 1 part, and the mash mixture was composed of ground corn, 4 parts; bran, 2 parts; beef scrap, 2 parts; linseed oilmeal, 1 part. The grain mixture was fed twice daily in the litter. The mash mixture, fed dry, was kept in hoppers to which the pullets had access at all times. During the winter months a small amount of clover chaff, and during the summer a limited amount of green feed were given. Before February 12, grit and bone were fed in troughs. After that time, oyster shells were substituted for bone, and the shells and grit were supplied in small hoppers. The pullets were given access to water at all times.

Prices of feeds: In all tests reported in this bulletin, the following prices per hundredweight for feeds are used:

Corn	$1.00	Bran	$1.30	Green feed	$ .25
Wheat	1.50	Middlings	1.30	Grit	.75
Oats	1.25	Oilmeal	1.80	Oyster shells	.75
Ground corn	1.09	Beef scrap	2.75	Bone	2.50
Cracked corn	1.09	Clover chaff	.50	Charcoal	2.25

Feed consumed: Table I shows the amount and cost of the various materials consumed by each lot, and the average amount and cost per pullet.

TABLE I. Amount and cost of feed consumed per lot for the year.

Lot No.	Av. number in pen	Grain	Mash	Grain and mash	Green feed	Clover chaff	Grit	Bone	Oyster shells	Cost of feed
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	
1	53 4	2520 7	1108.	3628.7	263.5	276.	15 0	32 5	84.0	$51.52
2	54.4	2555 4	1254.	3809.4	260 5	266.	15 5	12 5	100 5	52.79
3	55 5	2593 8	1205.	3798.8	260 5	279.	15 5	15 5	93 5	52 52
4	50.9	2439.6	1162.	3601.6	260.5	274.	15 0	21 0	83.0	50.15
		Average amount and cost of feed consumed per pullet.								
1	....	47.204	20.749	67 953	4 934	5.169	.281	.609	1.573	96.5c
2	....	46 974	23 051	70 025	4 789	4 890	.285	.230	1.847	97 0
3	....	46 735	21.712	68 447	4.694	5.027	.279	.279	1.685	94.6
4	....	47.929	22.829	70.758	5 118	5 383	.295	.413	1.631	98 5

Weights of pullets: The weights recorded in Table II, except for Lot 4 are for the pullets that finished the entire year. In Lot 4 the initial weight includes the weights of two pullets killed in a trap nest, while the final weight includes their weight at death. These birds are included because the loss is one that would not have occurred under ordinary conditions. The other losses were charged to the lots at the rate of 12 cents per pound. The gain in weight was credited to the lots at the same rate per pound.

TABLE II. Initial and final weight and gain for the year.

Lot No.	Initial weight Dec. 1, 1910	Average initial weight per pullet	Final weight Dec. 2, 1911	Average final weight per pullet	Total gain	Average gain per pullet	Percentage gain in weight
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Percent
1	158.7	3.174	172.1	3 442	13.4	.268	8 44
2	166.9	3.210	176.1	3.387	9.2	.177	5 51
3	172 1	3.129	192.8	3 505	20.7	.376	12 03
4	163.6	3.272	175 0	3.500	11.4	.228	6 97

Egg production: The average egg production per pullet, as shown in Table III, did not vary greatly for the different lots. The variation in egg production of Lots 1, 3, and 4 is only 1.8 eggs per pullet for the year, while the pullets in Lot 2 laid 8.4 eggs, or 7.2 percent, more per pullet than did those in Lot 1.

TABLE III. Egg production.

Lot	Average number in lot	Total eggs produced	Average eggs per pullet	Percentage egg production
1	53 4	6253	117 1	32.08
2	54.4	6829	125 5	34.39
3	55 5	6599	118.9	32.58
4	50.9	6050	118 9	32.56

Mortality: The number of pullets that died from each lot during the year was as follows: Lot 1, 6; Lot 2, 4; Lot 3, 1; Lot 4, 6. The date of death of each of these pullets is shown in Table IV.

TABLE IV. Date of death of pullets in each lot.

Lot 1	Lot 2	Lot 3	Lot 4
April 1	May 6	June 17	January 29
May 9	May 19		January 31
May 21	July 10		March 3
June 16	November 24		April 5
September 11			May 12
November 11			August 29

No explanation can be given for the variation in losses in the different lots. This variation, however, suggests the need for at least duplicating an experiment before much importance is attached to slight differences in the results secured. If the pullets in the various lots had been fed different rations, there might be a tendency to favor the ration given to Lot 3.

Of the 17 birds which died in the four lots, only 2 are of the 75 purchased from one flock, while 15 are from the 149 purchased from a different flock. In addition to this loss, two birds in Lot 4 were killed in a defective trap nest. Since these deaths were the result of experimental equipment, they are not charged against the lot.

Summary: In Table V is presented a summary of the results secured in this test. The variation in the cost of eggs per dozen from the different lots is almost 1 cent or approximately 10 percent. The cost of eggs per dozen takes into account the cost of feed, on basis of prices given on page 516, the mortality, and the gain in weight of fowls which were living at the end of the year. The feed consumed, the mortality, the gain in weight and the egg production are of more importance than is the cost as given in this table, on account of the fact that varying prices for feeds and poultry would make a considerable change in the cost of the eggs as shown.

TABLE V. Summary.

Lot No.	Average number in lot	Total grain and mash consumed	Average grain and mash consumed per pullet	Total cost[1] of feed	Average cost of feed per pullet per year	Value (at 12 cents per lb.) of gain in live weight	Value (at 12 cents per lb.) of pullets that died	Net cost[2] of eggs produced	Total eggs produced	Cost[2] per dozen eggs produced
		Lbs.	Lbs.							Cents
1	53.4	3628.7	67.953	$51.52	96.5c	$1.608	$2.328	$52 240	6253	10.03
2	54.4	3809 4	70.025	52 79	97.0	1 104	1 500	53.186	6829	9 35
3	55.5	3798.8	68 447	52 52	94 6	2.484	0.372	50 408	6599	9.17
4	50.9	3601.6	70 758	50 15	98 5	1.368	2.076	50 858	6050	10.09

[1]See page 516 for prices of feeds.
[2]Based on cost of feed, gain in weight and mortality.

The keeping of poultry for egg production is very often unprofitable. This may be due to a poor market for the product, as well as to a high cost of production. Profits may sometimes be realized where loss previously resulted, simply by more careful handling of the product and the location of a better market. On the ordinary market, the careful poultryman must sell his eggs at a price based on the price the purchaser can afford to pay for the inferior product of careless producers, from which some losses are sustained.

There are limited markets, such as high class hotels, restaurants, hospitals, city retail stores and private families, for select grades of eggs at somewhat higher prices than are paid on the common market. These markets are sometimes difficult to secure. The producer must first prove the quality of his product before a satisfactory price can be obtained. It should be remembered by both consumer and producer that when the consumer does pay a higher price for select eggs than for common grades, the increase in price to the consumer is not all clear profit to the producer, for much extra labor and expense are involved in the production and marketing of the improved product. The producer should, on account of this extra cost, secure a higher price than is ordinarily paid for common grades; while the consumer, on account of the better quality of the carefully handled product, can well afford to pay a fair premium above ordinary prices.

II

The data on the cost of egg production presented in the following pages were secured from November 25, 1911, to November 16, 1912, at the central Station at Wooster. When the building in which they were housed was completed, the pullets were placed in the different pens without regard to weight, age or breeding (except, of course, that breeds were kept separated), so that the different lots were not uniform. While these data would be of much more value if the birds in the various lots had been uniform, it is thought that these figures may be of some interest, in connection with the foregoing test, in showing the cost of egg production under conditions similar to the ones which existed when these data were secured.

The pullets in Lots 1, 2, 3 and 4 were Single Comb White Leghorns; those in Lot 5 were Barred Plymouth Rocks. They were all hatched during the spring of 1911. They were reared under practically similar conditions as regards feed and housing during the summer and fall. The average weight of the pullets, when the records for the different lots were begun, is shown in Table VII. The average age of the pullets in each lot December 1, 1911, is given in Table VIII.

The records for Lots 1 and 2 began November 25; for Lot 3, November 28; for Lot 4, December 4; and for Lot 5, November 28, 1911. The records closed November 16, 1912, for all lots. At this time the fowls were divided into lots for experimental work. Since egg production was very light when the records closed, there would have been very little increase in the egg production had the records been continued until they covered a full year, but the feed consumed would have been increased to some extent.

Forty-three of the pullets in Lot 1 began laying during the latter part of September and laid 849 eggs before the records reported here were started. Some of the pullets in Lots 2 and 5 began laying at the time the records were started, but none of those in Lots 3 and 4 began to lay until two to three weeks after the feed records were begun.

During the spring of 1912, 15, 24, 21, 60 and 109 pullets were taken from Lots 1 to 5, respectively, and placed in breeding pens. Those from Lots 1 to 4, inclusive, were in the breeding pens 39 days and those from Lot 5, 40 days. Records of feed consumed by the pullets from each lot are not available, because there were some pullets from each lot in several of the breeding pens. On this account the feed consumed and eggs produced while these fowls were in breeding pens are not included in the data presented in Tables VI, VII and VIII. The average number of pullets in each lot is secured by adding the number of days each pullet was in the lot and dividing by the number of days over which the records for the lot extend. When the pullets were taken from the breeding pens and placed in the laying house again, a number of the Barred Rocks were changed from the pen in which they had been prior to the time they were placed in breeding pens, to the other pen. On this account the records for the two pens of Barred Rocks are combined and presented as one lot. Lots 1, 2, 3 and 4 each occupied a pen 15x24 ft. (without outside yards) in the laying house at this Station. (See pages 537-41 for description of this house.) Lot 5 was equally divided in two pens.

All lots were fed alike. The grain mixture consisted of shelled corn, 4 parts, by weight; wheat, 2 parts; oats, 1 part. The mash mixture was made up of ground corn, 2 parts; bran, 3 parts; beef scrap (50 percent protein), 1 part; middlings, 1 part. From October 20 to November 16, 1912, 1 part of old process linseed oilmeal was added to the mash mixture. The grain was fed twice daily in the litter. The mash was fed dry in hoppers which were always open, and on this account a definite proportion of grain and mash was not maintained. It ranged from 42.7 percent as much mash as grain, consumed by Lot 3, to 53.6 percent as much, consumed by Lot 1. The

percentage for each lot is shown in Table VI. Green feed, consisting of timothy and clover from May 16 to November 4, and of cabbage from this time on, was used. Prior to May 16, no green feed was given. The birds had access to grit, oyster shells and charcoal during the entire time. A small amount of ground bone was placed in the grit hoppers April 4, but its use was discontinued when this had been consumed.

The total amount of feed and other materials consumed is shown in the first part of Table VI. The amount consumed per pullet is shown in the latter part of this table.

TABLE VI. Feed consumed per lot.

Lot No.	Av. number in lot	Grain	Mash	Grain and mash	Percentage of mash to grain	Oyster shells	Grit	Charcoal	Ground bone	Green feed
		Lbs.	Lbs.	Lbs.	Percent	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	82.5	3575.0	1914.80	5489.80	53.6	169 5	17.00	5 20	2 5	298.3
2	76.5	3402.5	1747.15	5149.65	51.4	181.0	36.40	9 10	2.5	298.3
3	75.8	3337 4	1425 35	4762.75	42.7	155.8	9.05	6 10	2.5	297.9
4	78.4	3346 1	1462.60	4808 70	43.7	121 8	58 40	4.05	2.5	298.3
5	151.4	8117.5	4091.60	12209.10	50.4	283.6	35.20	7.50	5.0	596.6
				Average feed consumed per pullet.						
1	....	43.33	23 21	66.54	....	2.05	206	.063	.030	3 616
2	....	44.48	22.84	67.32	....	2.37	476	.119	.033	3 899
3	....	44.03	18.80	62 83	...	2.06	.119	.090	.033	3.930
4	....	42 68	18.66	61.34	....	1 55	.745	.052	.032	3 805
5	....	53.62	27.02	80 64	....	1 87	.232	.050	.033	3.940

The average weight per pullet at the time the records for the different lots were begun and again November 14, 1912, is given in Table VII. On account of the fact that a few pullets were sold from some of the pens and a number added during the spring of 1912, of which the weights were not recorded, the total loss for the lots is approximated by multiplying the loss in average weight per pullet by the average number in the lot. The charge for loss in weight is secured by combining this loss with the weight of pullets that died during the year, as shown in the following table.

TABLE VII. Weight, mortality and loss (—) or gain in weight.

Lot	Average initial weight per pullet	Average final weight per pullet	Average loss or gain in weight per pullet	Loss or gain in weight of lot. based on average loss or gain per pullet	Number of pullets that died	Weight of pullets that died	Total loss or gain in weight	Value of loss or gain in weight at 12c per pound
	Lbs.	Lbs.	Lbs.	Lbs.		Lbs.	Lbs.	
1	3.078	2.956	—.122	—10.1	2	5.9	—16.0	—$1.92
2	2.982	3.120	.138	10.6	8	21.3	—10.7	—1.28
3	2.444	3.073	.629	47.7	11	29 8	17 9	2.15
4	2.401	3 175	.774	60.7	4	9.2	51 5	6.18
5	3 858	5.291	1.433	217.0	24	126.95	90.05	10.81

A summary of the results secured in this work is given in Table VIII. The reader will find the figures showing the feed consumed per pullet, as given in the latter part of Table VI, and the eggs produced, as shown in Table VIII, of more value than the figures in this table which show the cost of production. This is due to the fact that fluctuations in the price of feeds and poultry in the same locality from time to time, and in different localities at the same time, would materially change the cost as shown in Table VIII. The figures given in this table are based upon prices for feeds as shown on page 516.

TABLE VIII. Summary.

Lot	Average number of pullets in lot	Average age Dec. 1, 1911	Length of time covered by records	Eggs produced	Cost of feed	Value of loss(—)or gain in weight	Cost of eggs[1]	Av. eggs per pullet[2]	Av. cost of feed per pullet	Av. cost of eggs per dozen[1]
		Days	Days							Cents.
1	82.5	243	358	11,678	$72 20	—$1.92	$74.12	141.6	$ .875	7.62
2	76.5	209	358	10,685	68 06	— 1 28	69.34	139 7	.890	7.79
3	75.8	185	355	8,562	62.17	2 15	60 02	113.0	.820	8.41
4	78 4	168	349	8,214	62 89	6 18	56 71	104 8	.802	8 28
5	151.4	191	355	16 540	159.21	10.81	148 40	109.2	1.052	10.77

[1]Based on cost of feed consumed at prices given on page 516, and loss or gain in weight at 12c per pound.

[2]If the eggs laid by the pullets when they were in breeding pens, as mentioned on page 520, are included, the average egg production per pullet is 141.9, 141.8, 115.1, 112.2 and 114.4, for Lots 1 to 5, respectively.

CAPON FEEDING

The object of this experiment was to compare the efficiency of a ration made up of corn, ground corn and beef scrap with that of a ration made up of corn, wheat, oats, ground corn, bran and beef scrap. This included a study of the amounts of the various feeds selected by the fowls when they had free access to each of the different feeds. Four lots of capons were used in this experiment. Lots 1 and 3 received the ration made up of the greater variety of feeds while Lots 2 and 4 received the ration composed of corn, ground corn and beef scrap.

Description of capons: The capons used to make up Lots 1 and 2 were strong, vigorous birds, hatched June 6, 1911 and caponized October 6, 1911. Those used in Lots 3 and 4 were hatched between May 23 and June 22, 1911, and caponized October 25. There was more variation in size of birds and less constitutional vigor in Lots 3 and 4 than in Lots 1 and 2. The birds were Barred Plymouth Rocks.

Housing: Each lot occupied half of a 10x12 ft. shed-roof house similar to the one shown on page 542 of this bulletin. During the early part of the experiment the capons were allowed access, during the day, to yards containing about one-fifth of an acre. These yards, however, furnished very little, if any, green feed. After January 11, the weather was so severe that the birds were confined to the houses.

Manner of feeding and watering: In order to allow the birds to eat of the various feeds as they desired, the different feeds were kept in separate divisions of a feeder. The birds had access to grit, charcoal and oyster shells at all times, and to water during the day time.

Manner of weighing birds and feed: The birds which were to make up Lots 1 and 2 were weighed on December 9 and divided into two lots of as nearly equal weight as possible. They were also started on the experimental rations on the above date. The average of three weights taken December 11, 12 and 13 was used as the initial weight of the experiment. The birds used in Lots 3 and 4 were weighed and divided into two lots on December 12, when they were started on the experimental rations. The initial weights are the average of three weights taken on December 25, 26 and 27. The final weights of Lots 1 and 2 were secured on February 6, 7 and 8, and of Lots 3 and 4 on February 5, 6 and 7. The birds were also weighed once each week to note the progress they were making. They were weighed individually each time. They were weighed in the morning before they were given access to feed and water, which had been withheld since the night previous. The feed remaining in the hoppers when the weekly weights of the birds were taken, was weighed, thus making it possible to determine the weekly consumption of feed. Grit, charcoal and oyster shells were not calculated on a weekly basis, but the total amount consumed during the entire experiment was calculated.

Mortality: During the experiment one bird in Lot 4 and two in Lot 3 died. As no diseased condition of the bodies was revealed by a post mortem examination, the cause of these deaths is not known.

TABLE IX. Feed consumed.

Lot	No. in lot	Length of test	Corn	Wheat	Oats	Ground corn	Bran	Beef scrap	Total[1]	Grit	Oyster shells	Charcoal
		Days	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	13	57	147.8	79.15	3.95	29.05	2.20	9 20	271.35	.80	2 3	1 40
2	13	57	181.2	....	....	76.35	...	8.70	266 25	.85	2.5	1.65
3	17[2]	42	65.4	122.90	7.20	38.30	2.35	10.30	246.45	.85	2.7	1.70
4	17[3]	42	166.6	.....	....	71.95	....	9.10	247.65	1.05	1.3	3.20

[1]Total does not include grit, oyster shells and charcoal.
[2]One capon died at end of 3rd week and one at end of 4th week.
[3]One capon died at end of 5th week.

Table IX gives the amounts of the various feeds and other materials consumed by the different lots during the experiment. Table X shows the feed consumed per bird by weekly periods. It is interesting to note that in both cases the lots receiving the greater variety of feeds consumed slightly more beef scrap than did those

that received only corn and ground corn in addition to the beef scrap. It will also be observed that the birds in Lot 1 consumed 147.8 pounds of corn and 79.15 pounds of wheat while those in Lot 3 consumed only 65.4 pounds of corn and 122.9 pounds of wheat.

TABLE X. Average feed consumed per capon by weekly periods.

Date	Lot 1 Ration: Corn, wheat, oats, ground corn, bran and beef scrap	Lot 2 Ration: Corn, ground corn and beef scrap	Lot 3 Ration: Corn, wheat, oats, ground corn, bran and beef scrap	Lot 4 Ration: Corn, ground corn and beef scrap
	Lbs.	Lbs.	Lbs.	Lbs.
Dec. 12-18	3.104	3 169	.....	.....
Dec. 19-25	2.750	2.800	.....	.....
Dec. 26-Jan. 1	2 642	2.558	2.615	2.465
Jan. 2-8	2.562	2.105	2.706	2.635
Jan. 9-15	2.623	2.712	2.647	2.632
Jan. 16-22	2.465	2.454	2.528	2.274
Jan. 23-29	2.212	2.204	2.360	2 312
Jan. 30-Feb. 6	2.515	2.477	2.343[1]	2.391[1]

[1]Ending Feb. 5th.

Table XI shows the cost of the various feeds consumed, with prices for feeds as given on page 516. It will be noted that the cost of feed in both cases was lower with the lots receiving the ration made up of corn, ground corn and beef scrap. This difference is greater in the case of Lots 3 and 4, because Lot 3 consumed a considerably larger amount of wheat than did Lot 1. With wheat and corn charged at more nearly the same price per hundredweight, this difference would not be so great.

TABLE XI. Cost of feed consumed.

Lot	Corn	Wheat	Oats	Ground corn	Bran	Beef scrap	Grit	Oyster shells	Charcoal	Total
1	$1.478	$1.187	$ .044	$ .316	$ .029	$ .253	$.006	$ .017	$ .032	$3.36
2	1.812	.....	....	.832	....	.239	.006	.019	.037	2 95
3	.654	1.844	.081	.417	.031	.283	.006	.020	.038	3 37
4	1 666	.....	....	.784	....	.250	.008	.010	.072	2.79

Table XII gives the initial and final weight, gain in weight, and percentage gain of each bird. It will be noted that there was considerable variation in the gain in weight and percentage gain of the different birds. Attention is called to capon No. 1019 in Lot 2 which gained 3.817 pounds or 82.69 percent as compared with No. 1024 in the same lot, which gained 1.45 pounds or 26.53 percent.

Table XIII shows the weight and gain of each lot by weekly periods. While there was a great irregularity in the gains from week to week, it will be observed that the gains became much lower during the latter part of the experiment.

TABLE XII.

Lot 1—Various feeds—57 days					Lot 2—Corn and beef scrap—57 days				
Capon No.	Av. initial weight	Av. final weight	Gain	Percentage gain	Capon No.	Av. initial weight	Av. final weight	Gain	Percentage gain
	Lbs.	Lbs.	Lbs.	Percent		Lbs.	Lbs.	Lbs.	Percent
1003	5.300	8.316	3.016	56.91	1000	5.050	7.683	2 635	52.14
1004	5.883	8.516	2.633	44 76	1001	4.366	6 483	2 117	48.49
1005	5 533	8.550	3.017	54 55	1002	4.250	6.483	2.233	52.54
1006	4.683	7.016	2.333	49.82	1007	5 483	7 633	2.150	39.21
1008	4.616	6.133	1 517	32.86	1009	5.833	7.700	1.867	32.01
1012	3.366	5 150	1 784	53.00	1010	5.200	7.433	2.233	42.94
1014	5.300	8.083	2.783	52.51	1011	4.050	6.366	2.316	57.18
1015	4.116	6.166	2.050	49.80	1013	4.350	6.383	2.033	46.74
1016	4.583	6.600	2 017	44.01	1017	4.566	7.533	2.967	64.98
1018	4.983	6 916	1.933	38.79	1019	4.616	8.433	3.817	82.69
1020	4.350	6.666	2.316	53.24	1023	5.516	7 716	2.200	39.88
1021	5.033	7.900	2 867	56 96	1024	5.466	6.916	1.450	26.53
1022	5.850	8.283	2.433	41.59	1025	4.983	7.416	2.433	48.83
Total....	63.600	94.300	30.700	48.27	Total	63.730	94.180	30.450	47.78
Lot 3—Various feeds—42 days					Lot 4—Corn and beef scrap—42 days				
903	7.116	8 866	1.750	24.59	901	5.600	7 383	1.783	31.84
904	5 633	7.083	1.450	25.74	902[3]	5.916	7.900	1.984	33.54
907	5.000	6 150	1 150	23.00	905	4.883	6 600	1 717	35.16
909	6.483	7.266	0.783	12.08	906	5.183	6 750	1.567	30 23
910	5.766	6.600	0.834	14.46	908	7.016	8 233	1.217	17.35
911	5.683	7.716	2 033	35.77	912	5.066	6 733	1 667	32.91
916	5.633	7 083	1.450	25.74	915	3.516	4.850	1.334	37.94
918	4 433	5 883	1.450	32.71	913	6.950	8.316	1.366	19.65
920	4.366	5 800	1 434	32 84	917	5 483	6.533	1.050	19.15
921[1]	6.350	7.600	1.250	19.69	919	5.583	6.500	0.917	16.42
925	4.966	6.016	1.050	21.14	922	4.600	6.666	2.066	44.91
926[2]	5.416	6.250	0.834	15.40	923	6.166	7.800	1.634	26.50
929	7.166	8.966	1.800	25.12	924	4.583	6.083	1.500	32.73
930	6.133	7.600	1.467	23.92	927	6.250	7 783	1.533	24.53
932	5.250	7.716	2.466	46.97	928	5.266	7 050	1.784	33.88
934	4.883	5 700	0.817	16.53	931	4.338	5.283	0.950	21 92
935	4.616	6.666	2.050	44.41	933	6.700	8.650	1.950	29.10
Total....	94.900	118 970	24.070	25 36	Total	93.100	119.120	26.020	27 95

[1]In test 28 days. [2]In test 21 days. [3]In test 35 days.

TABLE XIII. Weekly weights and gains

Date	Lot 1—Various feeds—13 capons				Lot 2—Corn and beef scrap—13 capons			
	Weight		Weekly gain		Weight		Weekly gain	
	Total	Av. per capon	Total	Av. per capon	Total	Av. per capon	Total	Av. per capon
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Dec. 11, 12, 13	63 60	4.892	....	....	63.73	4.902	....	....
" 19	69.15	5.319	5.55	.427	69.85	5.373	6.12	.471
" 26	75 00	5 769	5.85	.450	75.50	5 808	5.65	.435
Jan. 2	80.05	6 158	5.05	.388	79 05	6.081	3.55	.273
" 9	84 20	6.477	4.15	.319	83.15	6 396	4.10	.315
16	86 55	6.658	2.35	.181	86 60	6.661	3.45	.265
23	90 10	6.931	3.55	.273	89.95	6.919	3 35	.258
30	92.40	7.108	2.30	.177	91 70	7.054	1.75	.135
Feb. 6, 7, 8	94.30	7.254	1.90[1]	.146[1]	94.18	7.245	2.48[1]	.191[1]
	Lot 3—Various feeds—17 capons				Lot 4—Corn and beef scrap—17 capons			
Dec. 25, 26, 27	94 90	5.582	...	....	93.10	5 476	....	....
Jan. 2	99 50	5.853	4.60	.271	98.15	5.774	5.05	.298
" 9	106.40	6.258	6 90	.405	104.15	6 126	6 00	.352
" 16	111.00	6.529	4 60	.271	108 20	6.365	4.05	.239
" 23	108 50[2]	6.781	3.75	.236	113.05	6.650	4.85	.285
" 30	103 05[3]	6.870	2.15	.143	116.75	6.868	3.70	.218
Feb. 5, 6, 7	105.12	7.008	2.07	.138	111.22[4]	6 951	2.37	.148

[1] This gain is for eight days. [2] No. 926 taken out January 16, weight 6.25 lbs.
[3] No. 921 taken out January 23, weight 7.6 lbs. [4] No. 902 taken out January 30, weight 7.9 lbs.

Table XIV gives a summary of the experiment. Very little difference is shown in the gains produced by the two rations. Lots 1 and 2 made almost exactly the same gain, while Lot 4, getting corn, ground corn and beef scrap, gained approximately 2 pounds or 8.1 percent more than Lot 3, which received the greater variety of feeds.

TABLE XIV. Summary.

Lot	Ration	Gain	Feed consumed	Feed consumed per lb. gain	Cost of feed[1]	Cost of feed per lb. gain
		Lbs.	Lbs.	Lbs.		Cents
1	Corn, wheat, oats, ground corn, bran and beef scrap	30 70	271 35	8.83	$3.36	10.95
2	Corn, ground corn, beef scrap	30.45	266 25	8.74	2.95	9.67
3	Corn wheat, oats, ground corn, bran and beef scrap	24 07	246 45	10 24	3.37	14.02
4	Corn, ground corn, beef scrap	26 02	247 65	9 17	2.79	10.71

[1]See page 516 for a list of prices of feeds.

The feed consumed per pound of gain by Lots 1 and 2 was almost the same, but Lot 3 consumed slightly over a pound more feed per pound of gain than did Lot 4. The more important difference in this experiment is in the cost of feed per pound of gain, on account of some of the feeds which Lots 1 and 3 received being higher priced, under usual market conditions, than is corn, which constituted the chief part of the ration that was fed to Lots 2 and 4. The last column in Table XIV shows the difference in cost of feed per pound of gain. It will be noted that the cost per pound of gain with Lot 1, receiving the variety of feeds, was slightly more than 1 1-4 cents higher than with Lot 2, fed corn and beef scrap, while the gain produced by Lot 3 cost nearly 3 1-3 cents per pound more than did that produced by Lot 4. The higher cost of production with Lots 3 and 4 than with Lots 1 and 2, respectively, is probably due, in part at least, to the fact that the birds in Lots 3 and 4 were less vigorous than those in Lots 1 and 2. The reason for the greater variation in feed cost per unit of gain between Lots 1 and 3 than between Lots 2 and 4 is not apparent.

Figs. 1 and 2 show the capons used in Lots 1 and 2, respectively, after being dressed ready for packing. There was very little, if any, difference noticeable in the market quality of the dressed birds from the two lots, but those from Lot 2, which received corn, ground corn and beef scrap, had a yellower skin than did those from Lot 1. These illustrations show the manner in which the head and neck are wrapped for packing. This method of wrapping adds to the appearance of the dressed birds.

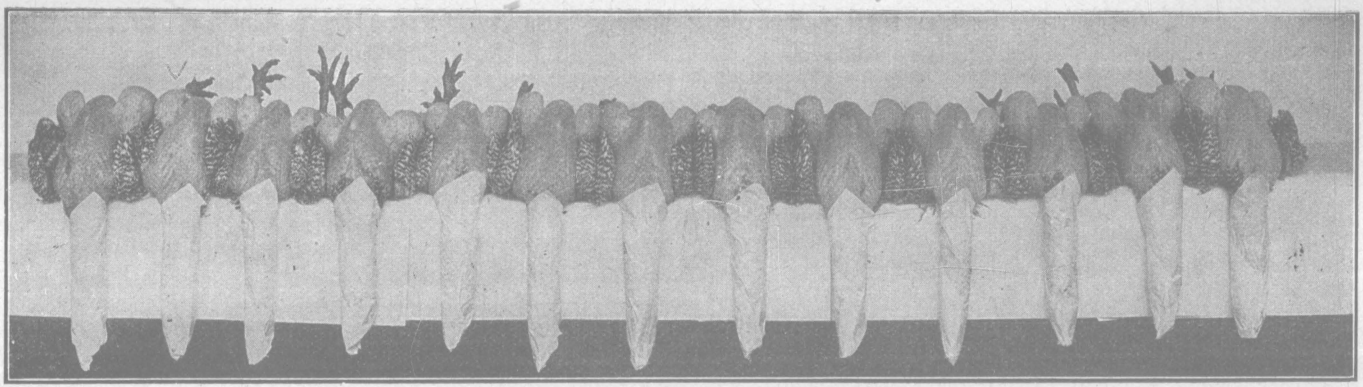


Fig. 1.—Capons used in Lot 1.

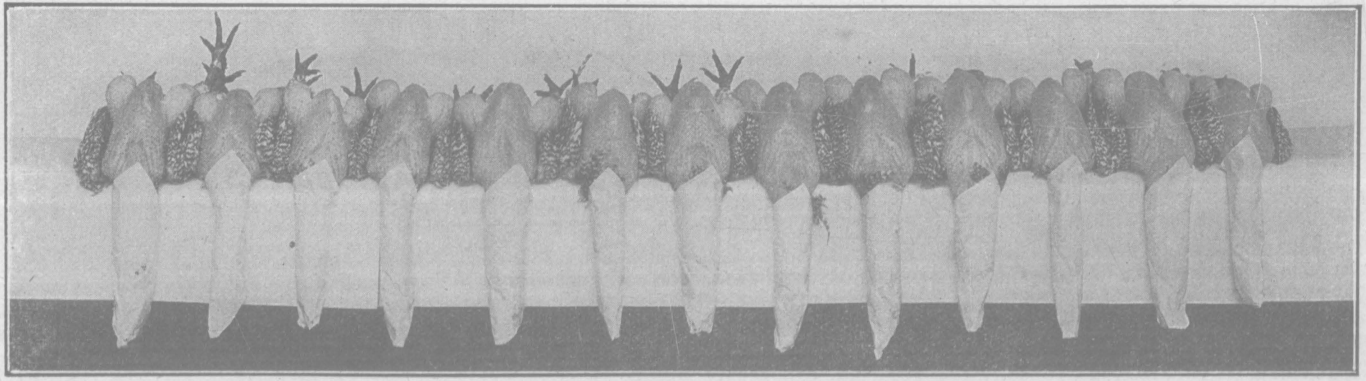


Fig. 2.—Capons used in Lot 2

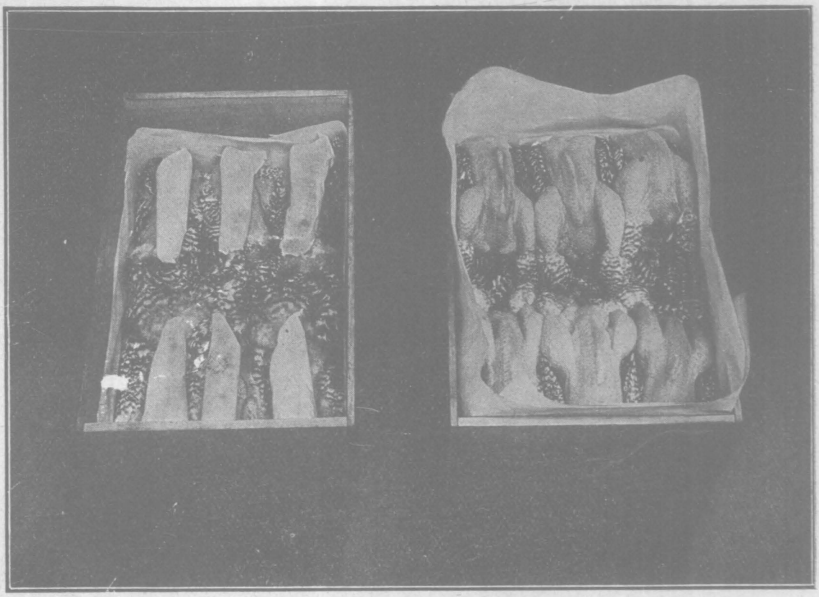


Fig. 3. Showing method of packing capons in boxes.

The box to the left in Fig. 3 shows one layer of six birds in place. The breasts are placed down with the heads and feet up. The box is lined with waterproof paper and a layer of this paper is placed over the birds in the bottom of the box before the rest are placed in position. The other box in Fig. 3 is packed full ready to be covered with paper and closed for shipment. The birds in the second layer are placed with breasts up and heads and feet down. By packing in this way, the birds show to good advantage, no matter from which side the box is opened.

The illustrations on the opposite page show the difference in appearance of a cockerel, capon and slip. The cockerel, at the top, shows his truly masculine characteristics, while the capon, in the center, shows practically no masculinity. The growth of the comb and wattles ceases when the operation is performed, although the growth of the plumage is considerably heavier than on the cockerel. The capon does not have the alertness of the cockerel but is more quiet and even sluggish in movements. The slip, at the bottom, is the result of an unsuccessful operation. Part of the testicle is not removed, and on this account the bird develops, and in appearance resembles the cockerel. Some slips develop sex character to such an extent that they may be mistaken for cockerels.

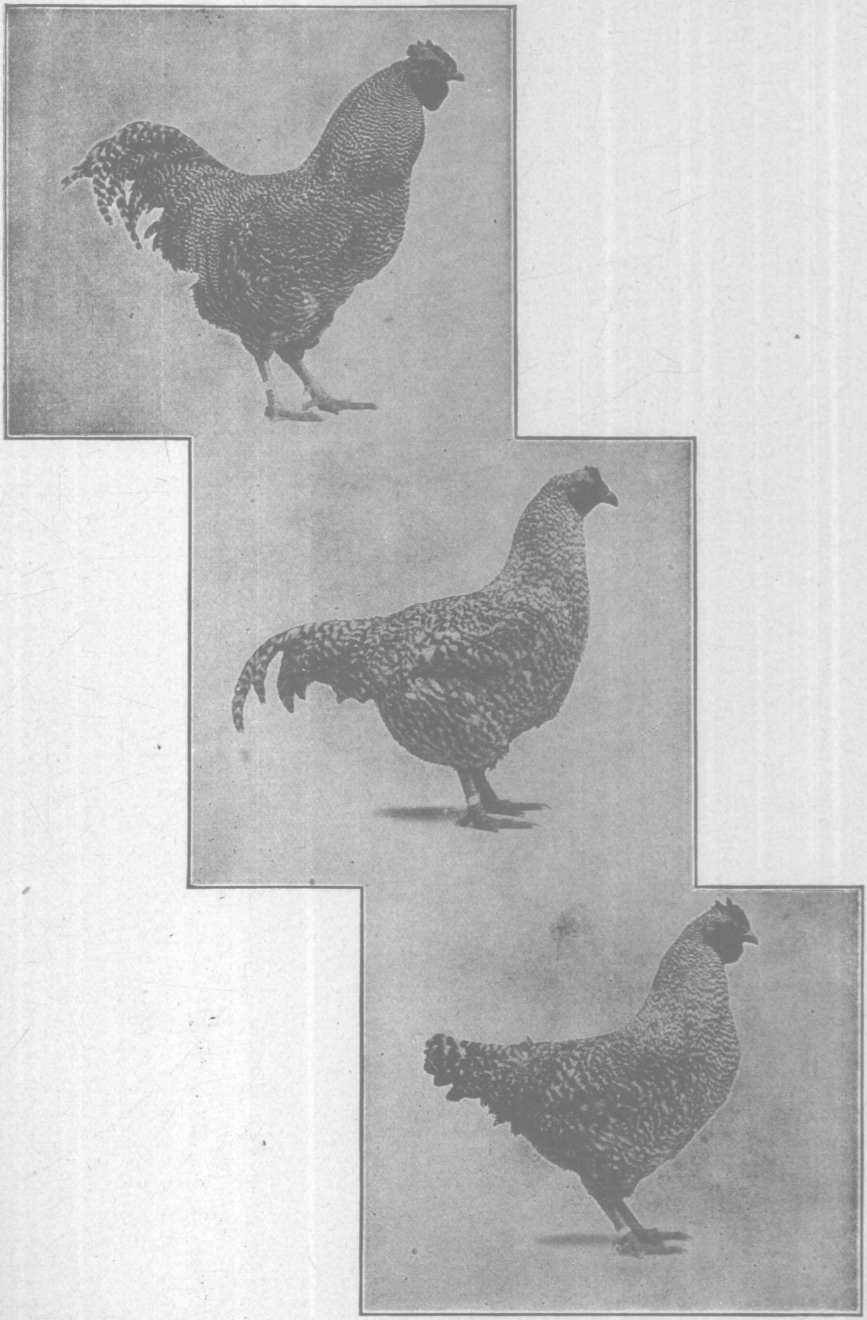


Fig. 4. Appearance of cockerel, capon and slip.

Anyone wishing information on caponizing is referred to Farmers' Bulletin 452, which may be secured from the U. S. Department of Agriculture, Washington, D. C., and to the printed directions that are furnished with caponizing instruments.

FERTILITY OF EGGS

LENGTH OF TIME, AFTER MATING, REQUIRED FOR EGGS TO BECOME FERTILE

The study of the fertility of eggs was begun in 1911 and continued in 1912. In 1911, three pens of Leghorns and three pens of Rocks were used, and in 1912, thirteen pens of Rocks were used in the test to determine the time which elapses after mating before fertile eggs are laid. All eggs laid after mating were used during the test conducted in 1911, and all those laid after the first day, during the 1912 test.

In this work, one male was mated with a pen of 12 to 15 females. Except for the two pens of Rocks hatched in 1909, that were mated in 1912, with which yearling male birds were used, the male birds used were cockerels.

TABLE XV. Sterile and fertile eggs laid.

Date males were placed in pens		Eggs laid each day after males were placed in pens															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Three pens of Rocks, hatched in 1909																	
March 9, 1911 3.30 p. m.	Sterile	5	6	4	4	1	2	1	1	3	1	3	1	0	5	2	1
	Fertile	0	2	0	7	4	5	9	7	7	8	7	9	11	11	9	10
Three pens of Leghorns, hatched in 1909																	
March 9, 1911 3.30 p. m.	Sterile	3	5	4	1	3	2	1	1	1	2	0	1	0	1	1	0
	Fertile	0	3	2	8	9	13	11	11	9	16	12	8	14	8	15	14
Two pens of Rocks, hatched in 1909																	
March 6, 1912 3 00 to 4 00 p. m.	Sterile		5	4	2	2	3	1	1	0	1	1	1	0	1	0	1
	Fertile		1	3	3	3	4	3	6	7	4	8	7	6	8	7	5
Eleven pens of Rocks, hatched in 1911																	
March 6, 1912 3.00 to 4 00 p. m.	Sterile	.	62	62	38	39	37	31	27	20	19	13	18	11	15	11	10
	Fertile	.	7	13	26	35	49	45	44	67	61	44	68	68	59	73	61

The eggs which were candled out and those which remained in the incubator unhatched after the chicks were taken out, were broken in order to correct any mistakes which might have been made in candling.

In using the terms fertile and sterile, or the abbreviations F and S, it should be understood that the eggs designated as fertile are those in which the embryo developed sufficiently to be detected without the aid of a microscope. All others are marked sterile.

Table XV shows the results secured in this test from 19 pens, approximately 230 fowls. It gives the number of fertile and sterile eggs laid on each day after mating, including the sixteenth. In the first three divisions of the table, it is seen that the fertility was at its best on and after the seventh day. In the last division of the table, which deals with Rock pullets, the fertility was not at its height until the twelfth.

LENGTH OF TIME AFTER MATING WAS BROKEN THROUGH WHICH FERTILE EGGS WERE LAID

Sixteen pens of fowls were used in the study of this phase of the fertility of eggs. In 1911, three pens of Rocks and three pens of Leghorns, and in 1912, ten pens of Leghorns were used in this work.

Table XVI shows the number of fertile and sterile eggs laid each day after mating was broken. It is noted that, in the first division of the table, the number of fertile eggs laid does not decrease until the twelfth day and that one fertile egg was laid on the twentieth day after the mating was broken. In the second and third divisions of the table, the number of fertile eggs decreases after the ninth day and in the last one the decrease starts after the eighth day. Judging from the results of this test, it would be safe to use eggs for hatching from pens for at least one week after the male bird is removed.

TABLE XVI. Sterile and fertile eggs laid after mating was broken

Date mating was broken		Eggs laid each day after mating was broken																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Three pens of Rocks, hatched in 1909																						
August 21, 1911 2.00 p. m.	Sterile	1	0	2	0	2	1	2	5	2	3	4	2	8	10	5	10	8	10	11	9	9
	Fertile	12	9	9	6	12	11	10	11	8	10	10	6	6	3	3	1	1	2	0	1	0
Three pens of Leghorns, hatched in 1909																						
August 21, 1911 2.00 p. m.	Sterile	1	1	0	2	0	2	1	5	4	7	6	8	8	12	13	10	14	13	14	12	13
	Fertile	17	17	15	18	16	11	16	15	10	9	9	10	4	2	2	0	0	2	0	0	0
Two pens of Leghorns, hatched in 1909																						
April 29, 1912 1:30 p. m.	Sterile	3	2	0	1	0	4	3	4	4	7	6	8	13	14	18	24	15	19	21	17	15
	Fertile	15	16	20	14	19	18	15	16	18	15	13	6	6	4	3	3	1	0	0	0	0
Eight pens of Leghorns, hatched in 1911																						
April 29, 1912 1.30 p. m.	Sterile	4	5	7	2	10	7	5	6	10	18	21	37	28	47	45	60	49	51	48	49	39
	Fertile	64	69	78	77	63	71	73	73	68	58	51	40	32	24	25	12	10	1	4	0	0

INDIVIDUAL MATING

Individual mating was carried on in addition to the foregoing work in order to secure more definite data regarding the time that elapses after mating before fertile eggs are laid, number of fertile eggs produced from one mating and length of time through which fertile eggs are laid. Single Comb White Leghorns were used in this work. Nos. 1-38 were hatched in 1909, the others in 1911.

In doing this work, the male bird was placed with the females and carefully watched. Whenever a hen was mated, her band number and the time of the mating were recorded. All eggs laid during this test were marked with the number of the hen that laid them and the date and hour laid. The eggs were incubated from two to four days and then broken to determine whether they were fertile or sterile.

In all, 46 hens were mated, but 4 of these laid no eggs, and 2 were mated on two different days, so that the following table contains the records of 40 hens. Of this number, 7 were mated more than once on the same day. Table XVII shows the date and hour each hen was mated, whether the eggs laid were sterile or fertile and the hour the first and last fertile eggs were laid. At the bottom of the table is given a summary of sterile and fertile eggs laid on each day after mating.

A study of Table XVII shows that the number of fertile eggs laid did not decrease very rapidly until after the twelfth day. The fertility was rather low throughout the test, due to the fact that seven hens laid no fertile eggs. It is not known whether this lack of fertility in the eggs produced by these hens was the result of imperfect mating or due to some abnormal condition of the hens. Three of these seven hens were in breeding pens in the spring and at that time a good percentage of their eggs were fertile.

Table XVIII shows a summary of the 26 hens, whose records are given in the foregoing table, which had only one mating and laid one or more fertile eggs. This summary gives the time after mating when the first and last fertile eggs were laid and the number of fertile eggs laid. The shortest time after mating in which fertile eggs were produced was about 42 hours—Nos. 38 and 351 both being very near this time. Nos. 309 and 403 laid sterile eggs approximately 48 and 46 hours, respectively, after mating. These were the only cases, however, that the first egg laid 42 hours or more after mating was not fertile.

The length of time after mating through which fertile eggs were produced varied with different individuals from a little less than a week up to nearly 18 days. The results secured in this test when the hens were mated individually and with a single mating were not far different from those secured in regular pen mating, as is usually practiced.

TABLE XVII. Results of individual mating—1912

Hen No.	Date and hour mated	Days after mating																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	August 26, 3:15 P. M.	..	1:00 F	1:00 F	..	..	..	..	.	..	..	..	..	..	.	..	..	..	..	..	..	..	..
4	August 23, 3:10 P. M.	S	12:30 F	F	..	F	F	F	F	..	F	F	..	7 30 F	S	S	..	..	S	S	..	S	.
8	August 23, 8:17 A. M.	S	4:00 F	..	F	F	F	..	..	S	S	S	4:00 F	..	S	S	S	S	..	S	S	S	..
15	August 23, 8:45 A. M.	..	10:30 F	F	..	F	..	F	F	..	F	..	F	..	11:00 F	..	S	S	..	S	S	..	S
17	August 27, 3:40 P. M.	S	..	8:00 F	..	..	F	F	..	F	F	..	F	F	.	9:00 F	..	..	..	..	..	..	..
18	August 27, 2:52 P. M.	S	..	8:00 F	F	F	..	F	F	..	..	F	F	S	..	8:00 F	..	S	S	..	..	..	..
20	August 27, 3:00 P. M.	S	..	10:00 F	..	F	..	F	F	..	F	..	10:00 F	..	..	..	..	..	..	..	..	..	..
22	August 27, 3:50 P. M.	S	4-00 F	..	F	F	..	F	F	..	F	..	F	..	10:00 F	..	S	S	..	..	..	..	..
24	August 23, 4:00 P. M.	S	S	S	..	S	S	S	..	S	S	..	S	S	..	S	S	S	..	S	S	..	S
26	August 24, 2:00 P. M.	S	11:00 F	F	..	F	F	..	..	F	F	10-30 F	S	S	S	..	..	S	S	..	S	..	S
27	August 24, 2:12 P. M.	S	..	S	..	S	..	..	S	S	..	S	S	..	S	S	..	..	S	..	S	..	..
31	August 27, 3:45 P. M.	S	2:00 F	..	..	F	..	F	..	F	S	..	1:00 F	..	S	..	.	..	..	..	..	..	..
35	August 23, 3:15 P. M.	S	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	August 23, 4:10 P. M.	S	10:30 F	F	..	F	S	S	.	S	F	..	S	S	S	S	.	1:00 F	S	..	S	..	S

TABLE XVII. Results of individual mating—1912. Continued.

Hen No.	Date and hour mated	Days after mating																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
309	August 26, 3.35 P. M.	..	4:00 S	..	1:00 F	..	S	..	..	..	F	..	F	S	..	..	9:00 F	..	..	S	S	..	..
351	August 24, 2:26 P. M.	..	9:00 F	F	..	F	..	..	10:00 F	..	..	S	..	S	..	S	..	S	..	S	..	S	S
356	August 26, 2:50, 4:00	S	..	10:00 F	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	..	..
376	August 27, 2:00, 3:30	..	..	..	..	2:00 F	..	F	F	..	F	..	F	4:00 F	..	..	..	S	..	S	..	..	..
377	August 23, 3.20 P. M.	..	4:00 F	..	F	F	..	9:00 F	S	S	..	..	..	S	..	..	..	S	..	S	S	..	S
383	August 26, 3:30 P. M.	S	..	8:00 F	F	..	F	F	F	..	..	..	1:00 F	..	..	..	..	..	..	..	..	..	..
384	August 27, 3:07 P. M.	S	2:00 F	.	F	F	F	..	..	..	F	..	F	F	..	F	1:30 F	..	S	S	..	..	..
393	August 27, 2:12 P. M.	S	..	S	..	..	S	..	S	S	..	..	S	.	..	..	..	..	..	..	..	..	..
397	August 26, 3:40 P. M.	..	..	2:00 F	..	F	F	F	..	F	..	F	..	S	..	..	2:00 F	..	S	..	S	.	..
403	August 28, 10:15 A. M.	..	9:00 S	1:00 F	..	S	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
408	August 28, 9:57 A. M.	..	S	..	S	S	S	..	S	S	S	..	S	..	..	S	..	S	S	..	..	..	..
421	August 28, 9:30, 10:45	..	1:00 F	..	F	F	..	..	F	..	F	F	2:00 F	..	..	S	S	..	S	..	..	..	..
423	August 27 2:16, 3:22, 4:00	..	10:00 F	..	F	F	..	F	F	..	F	..	F	..	F	1:00 F	..	..	..	..	..	..	..
431	August 27, 2:22, 2:27, 3:35	..	..	..	S	..	..	11:00 F	..	F	..	F	..	F	..	11:00 F	..	S	..	S	..	..	..

TABLE XVII. Results of individual mating—1912. Concluded.

Hen No.	Date and hour mated	Days after mating																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
448	August 23, 3:21 P. M.	S	..	11:00 F		F				F	S	.	S	..	S	..	S	2.00 F		S	S	..	..
450	August 26, 3:35 P. M.	S	1:00 F	.	F	S	.	..	9:00 F	S	.	S	S	S	..	S	.	S	S	..	S	..	..
555	August 28, 9:50, 10:30	S	..	1:00 F	..	..	F		F	.	.	..	..	11 00 F	..	S	..	S		..	..	..	..
558	August 28, 9.40 A. M.	S	..	..	3:00 F	..	F	.	.	.	F	..	F	F	.	S	.	9:30 F	.	S	..	S	..
594	August 28, 9:55, 10:10	..	8:00 S	..	..	..	S	..	4:00 F		F	F	.	.	S	4:00 F	..	S	S	.	..	..	..
595	August 28, 9:15 A. M.	..	S	..	..	.	..	.	S	..	S		.	S	..	S	..	S	.	.	..	..	..
620	August 26, 3:55 P. M.	S	..	8:00 F	F	..	F	S	F		F	F	F	..	F	F	2:00 F	..	S	S	..	S	..
626	August 27, 3:20 P. M.	S	..	..	..	3:00 F	..	F	F	.	S	.	.	F	3 00 F	..	S	..	S	S		..	..
630	August 27, 4:10 P. M.	S	2:00 F	..	F	S		F		F	..	.	F	..	..	2 00 F	..	S	..	S	..	.	..
640	August 27, 4:01 P. M.	S	..	S	..	S.	S	.	.	.		S		S	S	.	S	.	S	S	..	..	.
645	August 27, 3:11 P. M.	S	..	..	11:00 F	F	..	F			F			8:00 F	.		S			.	..	..	..
666	August 24, 3:15 P. M.	S	4:00 F	..	F	F	..	F	..	F			F	1.00 F	.		S		S	S	.	S	..
	Total fertile	0	16	16	15	20	10	17	15	8	16	8	17	10	5	8	4	3	0	0	0	0	0
	Total sterile	26	6	4	2	7	7	3	5	8	7	5	8	11	9	12	10	16	15	17	11	6	6

TABLE XVIII. Summary of the individual mating of 26 hens.

Hen No.	Time[1] after mating when first fertile egg was laid		Time[1] after mating when last fertile egg was laid		Total number of fertile eggs laid
	Days	Hours	Days	Hours	
1[2]	1	22	2	22	2
4	1	21	12	16	9
8	2	8	12	8	5
15	2	2	14	2	8
17[2]	2	16	14	17	8
18	2	17	14	17	8
20[2]	2	19	11	19	6
22	2	0	13	18	8
26	1	21	10	21	7
31	1	22	11	21	5
38	1	18	16	21	5
309	3	21	15	17	4
351	1	19	7	20	4
377	2	1	6	18	4
383[2]	2	17	11	22	6
384	1	23	15	23	9
397	2	22	15	22	7
403[2]	3	3	3	3	1
448	2	20	16	23	4
450	1	21	7	17	3
558	4	5[3]	17	0	6
620	2	16	15	22	10
626	5	0[3]	14	0	5
630	1	22	14	22	4
645	3	20[3]	12	17	5
666	2	1	12	22	7

[1]Eggs were gathered every hour, so the time given in this table is only approximately correct.
[2]These hens stopped laying before sterility was established.
[3]These were first eggs laid after first day following mating.

POULTRY BUILDINGS AT OHIO EXPERIMENT STATION

W. J. BUSS

LAYING HOUSE

On the next page is shown an illustration of the laying house that is being used at this Station. This house is 24 ft. x 100 ft. in size. It is divided into six pens, each 15 ft. x 24 ft., and a feed room, 10 ft. x 24 ft. The feed room is located in the center of the house. Partitions of matched sheathing divide the feed room from the pens. Partitions of 2-inch mesh poultry netting are used to divide the pens.

A concrete foundation wall is used under the house. A tile drain was laid in the outside bottom of the trench dug for the wall. No wooden sills are used on the concrete wall. The studs are fastened to the wall by means of an iron pin placed in the bottom of each and in the concrete wall.

No artificial floors are used in the pens. A concrete floor is used in the feed room. On ground that is not well drained, artificial floors would probably be needed to prevent the pens from becoming damp.

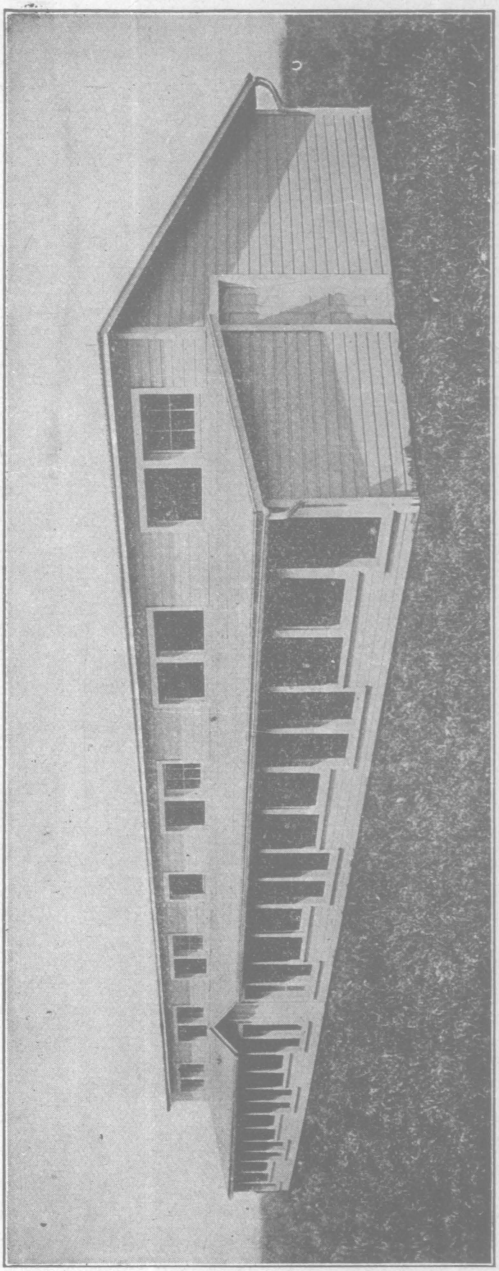
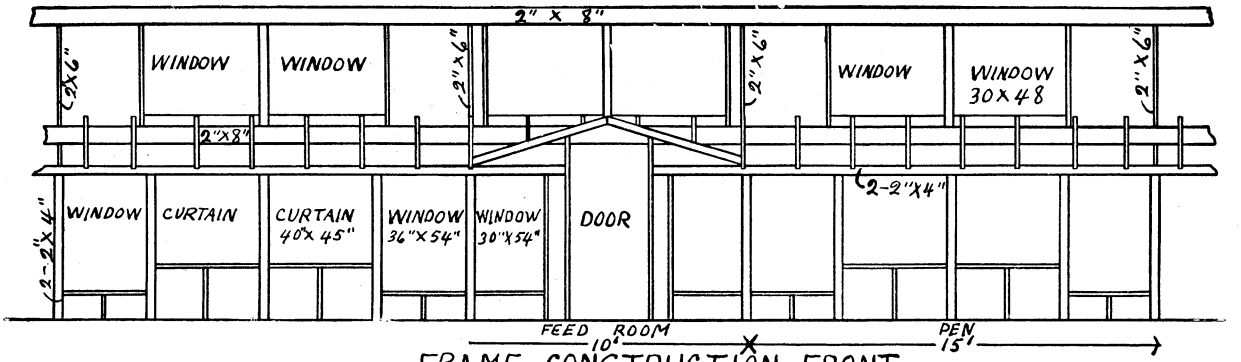
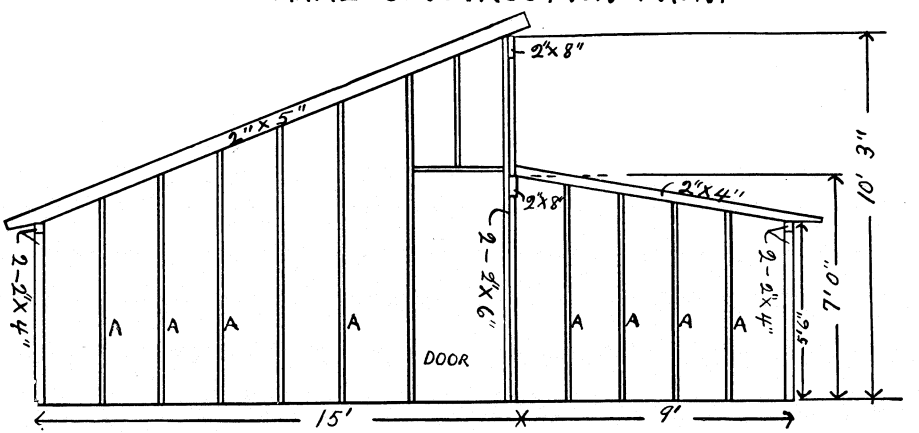


Fig. 5. Laying house at Ohio Experiment Station.



FRAME CONSTRUCTION-FRONT



FRAME CONSTRUCTION-END

FRAME CONSTRUCTION OF PARTITIONS SAME AS THIS, EXCEPT THAT STUDS MARKED "A" ARE LEFT OUT

Fig. 6. Frame construction of laying house.

The arrangement and dimensions of doors, windows and curtains are shown in Figs. 5 and 6. The deeper openings shown in the front of the house in Fig. 5 are fitted with windows; the shallower ones, with curtains. The curtain frames are made of 1 in. x 4 in. strips, nailed together at the corners. These frames are covered with a very thin grade of muslin. Two doors in the rear of each pen near the eaves are not shown in the illustrations. These are 20 inches high and 45 inches long. All windows and curtained openings and openings for the doors in the rear of the house are closed with 1-in. mesh wire netting. This netting in one of the curtained openings in each pen is fastened to a removable frame, which makes a convenient place through which to put straw into the pens and remove the litter.

The windows in the upper part of the house are hinged at the bottom to swing in. The curtains and windows in the front of the house are hinged at the top to swing in. The doors in the rear wall of the house are hinged at the top to swing out. Probably a more convenient arrangement for these would be to hang them to swing in.

The walls of the house are of a single thickness of matched siding. The roof is made by laying one thickness of matched sheathing on the rafters and covering this with one of the better grades of prepared composition roofs, of which a number are on the market.

The arrangement of the various appliances in the pens and feed room is shown in the drawings on page 541. The trap nests are placed under the droppings boards.

The size of material used in this house, as shown in the drawings, seems to be satisfactory for this location. Where wind pressure or snow fall differ from what they are here, some variation in size of lumber might be advisable. The framing material in the house is of oak. The siding and sheathing for the roof are of yellow pine.

A house of this type, of a size to accommodate the desired number of fowls, should prove satisfactory in places having the same latitude as Ohio, and probably even farther north or south. This house has been found especially satisfactory during hot weather. In colder climates the windows in the upper part of the house could probably well be double-glazed to prevent radiation to a considerable extent. It might appear, at first sight, that the cost of construction of a house of this type would be greater than that of a shed roof house of the same dimensions. It will be found, however, that there will be very little, if any, difference in the cost, when both houses are built of the same grade of material.

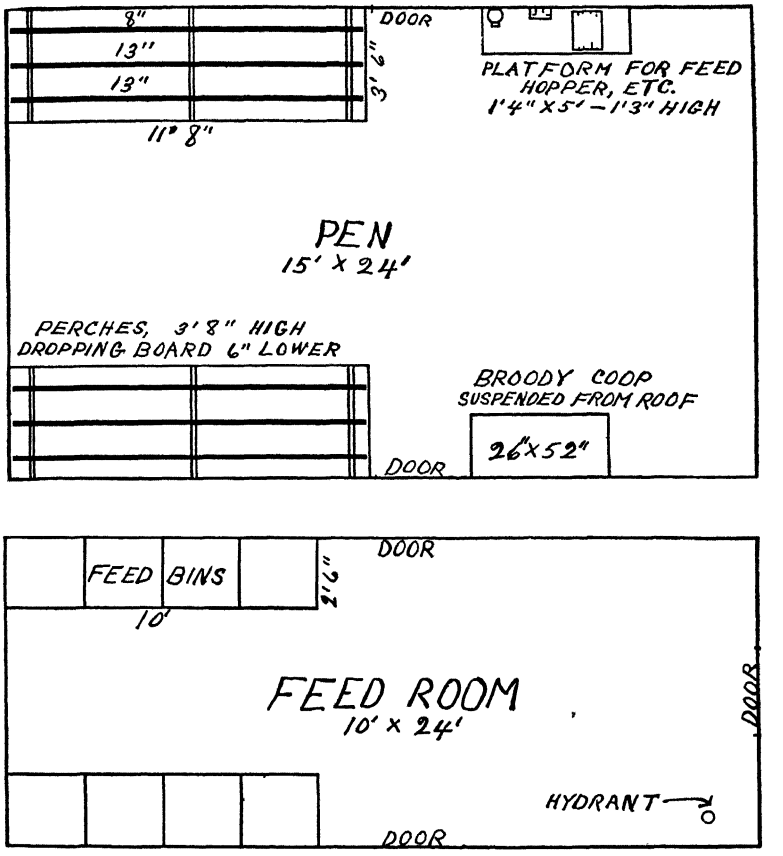


Fig. 7. Plan of pen and feed room in laying house.

COLONY HOUSE

The type of colony house that is being used at this Station is illustrated in Fig. 8. This house is 10 ft. x 12 ft. in size. It is 8 feet high in front and 5 feet, 6 inches high in the rear. The house is divided from front to rear into two pens, each 6 ft. x 10 ft. in size. The perches are placed along the back wall of the house.

The windows and the curtained openings in the house are each 2 ft. 4 in. x 3 ft. 4 in. The windows and curtains are hinged at the top to swing in. A door 2 ft. 4 in. x 5 ft. 10 in. is placed in each end of the house. Two small doors, 9 x 24 inches, are placed near the eaves in the rear wall of the house. These are hinged at the bottom to swing in. The windows are placed in the two openings nearer the center of the house so the sunshine will fall upon the pen floor during the early forenoon and late afternoon in winter rather than upon the walls of the house, as would be the case if they were placed in the outer openings.

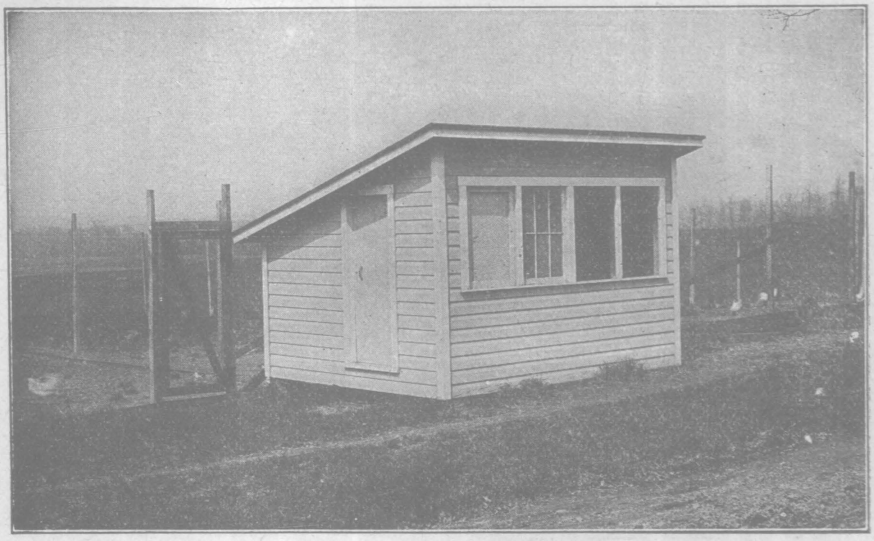


Fig. 8. Colony house.

These houses, as used at this Station with walls constructed of a single thickness of matched siding, are very satisfactory for use during spring, summer and autumn, but some trouble has been experienced during extremely cold weather from frozen combs, especially with Leghorns. With houses built deeper than those in use here, to accommodate larger flocks, this difficulty would be overcome to some extent. Double boarding the rear wall and the roof over the perches would also aid in making the house warmer.

For housing small breeding flocks and growing stock, especially where it is desired to move them frequently in orchards or over comparatively rough land, houses somewhat smaller than the one described above would perhaps be more desirable. A low-wheeled wagon has been constructed especially for moving the colony houses in use here, and with this and a team of horses they can be readily moved over relatively smooth ground, but where conditions as mentioned above exist, smaller houses would doubtless prove more satisfactory.